obliteration of the processus vaginalis. (*b*) Enlargement of the internal ring.

2. The internal ring is an opening through the endo-abdominal (transversalis) fascia.

3. Repair of oblique hernia consists of: high removal of the sac; closure of the internal ring by repair of the structure through which it is an opening, namely, the endo-abdominal fascia.

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DISCUSSION

W. S. KISKADDEN, M. D. (1930 Wilshire Boulevard, Los Angeles).—Doctor Dickson has presented in a clear concise manner the salient points regarding hernioplasty, and his review of the anatomy is exact and pertinent. Doubtless all of us have adopted a technique which gives more or less good results, but often our technique may become routine and overlook a true anatomical reconstruction.

I am in accord that high ligation of the sac is important and all that may be necessary. However, one should always repair the internal ring. Often sutures placed after the method advanced by Connell are adequate. Routinely, however, the use of the transversalis fascia to reconstruct a new floor is logical and correct anatomically. Doctor Dickson has again pointed out the importance of this fascia and clearly outlined why the use of the internal oblique is to be discouraged.

I do not believe too much stress can be laid upon the fact that the canal is normally oblique and should regain this obliquity in the reconstruction. Reference to Connell's article will show excellent sagital diagrams of the fascial and muscle layers and should create an indelible picture of the importance of the transversalis fascia and the internal ring.

Statistics vary from one per cent to ten per cent on recurrences following various procedures. Any technique, therefore, that offers the results that Doctor Dickson claims is worthy of careful study and consideration.

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O. O. WITHERBEE, M. D. (1401 South Hope Street, Los Angeles).—I wish to compliment Doctor Dickson on the able presentation of his subject and also for the perseverance he has shown in building up his faith in the technique he has outlined.

It is difficult in discussing this subject to adhere closely to the points enumerated in the paper and to refrain from introducing and elaborating on such methods as the speaker may have devised in procedures of his own.

Doctor Dickson has laid special stress, and rightly, on the resistance offered by the transversalis fascia in the prevention of hernia. Its importance may be measured directly in proportion to the weakness or deficiency of the remaining layers of the abdominal wall. Nature, usually so lavish in other respects, has been extremely penurious in her supply of worthwhile tissue in the inguinal region. It is quite evident that man was not constructed for the upright position. All four-footed animals exhibit this same deficiency, their exemption from hernia depending on the fact that the horizontal position throws no direct and continuous strain on the inguinal structures.

Referring again to the transversalis, let me say that its competence depends immediately upon the support of the overlying structures, and if these are deficient the fascia must of necessity give way in time. In the vast majority of patients we observe the whole floor of the inguinal canal greatly relaxed and often, in long-standing cases, so thinned out as to be apparently absent. This condition could never obtain if the muscular wall was complete and offering the same resistance it does in other localities. The arching fibers of the internal oblique, as they sweep from Poupart's ligament over to the edge of the rectus, should completely cover the internal ring, thus reinforcing the transversalis at this point.

It is surprising, however, to note the large number of cases in which this does not occur; in fact, this deficiency in the internal oblique is considered by many to be the most potent predisposing cause of inguinal hernia. If this be true, then it is quite evident that the reconstruction of this abdominal layer is most essential for successful repair.

As Doctor Dickscon has so aptly emphasized the importance of fascial layers for unyielding support, so I wish to emphasize the necessity of fascial reconstruction when once the transversalis has been weakened or thinned out sufficiently to destroy its natural support. If the transversalis has not lost its integrity and can be rebuilt, then well and good, but we must remember that in absence of proper support from the internal oblique, it gave way once and may again. It is still possible, however, to build a fascial layer of unusual strength by bringing the edge of the rectus sheath across to the shelving portion of Poupart's ligament and then to reinforce this line of union by imbricating the edges of the external oblique. Transplanting the cord is by no means necessary when these structures are once secured in proper position.

Regarding the percentage of returns, I wish to say unhesitatingly that should the patient develop another inguinal hernia it will not be on the same side.

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DOCTOR DICKSON (Closing).—I wish to thank Doctors Witherbee and Kiskadden for their frank discussions. I agree with Doctor Witherbee in the importance of strong muscle structures in the inguinal region. But that arching internal oblique muscle must be left free to contract. It must lie superficial to the internal ring as a reinforcing buttress. It must not be sutured about and beneath the cord where it cannot function, as in the Bassini operation; thus leaving a direct, short communication between the abdominal cavity and the superficial layers of the abdominal wall which is easily dilated again. A strong, snug, fascial closure at the internal ring about the cord must be made and should be made of the anatomical structure which normally belongs there.

BLADDER TUMORS—CLINICAL MANIFESTATIONS*

REPORT OF CASES

By LOUIS CLIVE JACOBS, M. D.
AND
ABELSON EPSTEEN, M. D.
San Francisco

DISCUSSION *by Charles P. Mathé, M. D., San Francisco; J. C. Negley, M. D., Los Angeles; Wilbur B. Parker, M. D., Los Angeles.*

MODERN writings on tumors of the bladder date from the introduction of the cystoscope into urology. Since then our knowledge has been materially increased by the addition of roentgenology. As a result of the world-wide studies which received an impetus through these mechanical aids, various classifications of bladder growths have been developed. Some of these are

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* Read before the urology section of the California Medical Association at the fifty-ninth annual session at Del Monte, April 28 to May 1, 1930.

based upon histological findings; others upon cystoscopic appearances; others upon a combination of these two methods; and still others upon the site of the tumors in the bladder.

All tumors of the bladder are potentially malignant. From a classical standpoint, Young's biological grouping is ideal. Clinically, however, it is practically impossible to determine the degree of malignancy of any particular tumor. Ninety per cent of all bladder tumors are composed chiefly of epithelial cells; and of this group the papilloma predominates. They are often located directly upon the trigon; but usually posteriorly and to one side of the ureteral orifices. While the majority of bladder tumors are primary, nevertheless many are secondary to growths in adjoining organs. In the male the growth may be secondary to a prostatic or rectal malignancy, and in the female, secondary to uterine carcinoma. Again kidney or ureteral growths may metastasize to the bladder.

Our interest in this subject has recently been stimulated by the addition of surgical diathermy to the therapeutics of bladder tumors. We have, therefore, reviewed this thesis as evidenced by the records for the past six years of the department of urology, Mount Zion Hospital, San Francisco. We have concerned ourselves not only with the therapeutic aspects, but also with the diagnostic and roentgenographic features thereof.

DIAGNOSIS

In the diagnosis of tumors of the bladder, the symptomatology, laboratory findings, cystoscopic appearances, and other data, have been found quite in conformity with those given in the various textbooks and in the numerous papers written upon this subject. However, we find that the knowledge derived from cystography has not received the attention and importance that it really deserves. We have routinely made cystograms and, at times, stereoscopic ones, and feel that our knowledge of each particular case has been materially increased thereby. A cystogram shows the outline of the bladder that has been made opaque by distending it with a medium impermeable to the roentgen ray. We use a freshly prepared and sterilized 13 per cent sodium bromid solution which is injected into the bladder by means of a soft rubber catheter.

Cystography can never supersede cystoscopic inspection, but it can and should supplement it. Cystoscopic inspection is a direct visualization of the pathology, cystography is an indirect view; and direct ocularization is the highest type of clinical diagnosis. The cystogram should corroborate the cystoscope. In addition, it may give us data not obtainable by cystoscopy. In many patients, cystoscopy is impossible or unsatisfactory because of instrumental intolerance, profuse hemorrhage, size of tumor mass, vesical contraction or deformity, or extravesical pressure. In these instances, cystography may reveal to us the desired information as to the site and extent of the tumor mass, and may aid in the selection of the proper therapeutic procedure.

An irregular filling defect of the normally smooth vesical outline characterizes a neoplastic bladder. This defect is located at the site of the pathology and varies in direct proportion to the thickness and size of the growth. Just how large the neoplasm must be before it produces a cystographic deformity cannot be mathematically determined, but when it is of sufficient size to produce this finding, the treatment indicated is either surgical diathermy or resection.

The x-ray has likewise proved valuable in revealing conditions of ureteral reflux with secondary ascending kidney infections. Due to metastases, a change in the structure of the long bones may be detected. This will often be the first indication of a generalized carcinomatosis and is diagnostic of carcinoma of the prostate. The rationale of a routine complete general examination, including roentgenologic studies in every suspected malignancy of the bladder, with especial attention to both vaginal and rectal palpation, is evident. By so doing we often encounter a generalized carcinomatosis and refrain from futile bladder surgery.

MATERIAL FOR THIS STUDY

In our studies of tumors of the bladder for the past six years at Mount Zion Hospital we have reviewed fifty case histories. In these, cystograms were made of forty patients. Nineteen were positive, that is, the cystogram did not show a normal bladder. The majority revealed either a filling defect or an irregularity of the bladder wall. As regards the age, our youngest patient was twenty-nine and our oldest seventy-one years, the majority ranging from fifty-one to sixty-five years. As for sex, there were approximately three males to every female. The cystoscopic appearance varied from a small pedunculated papilloma to massive cauliflower growth, involving the major portion of the bladder wall; some of the growths almost entirely filled the bladder cavity. Only a very small percentage showed a single circumscribed growth upon the posterior wall. Eighteen of the fifty patients showed, cystoscopically, diffuse infiltration of the bladder wall. The ureteral orifices were involved in but two patients; in four others they were obscured by the massive size of the growths. In six of the patients, pain over the bladder was the predominating symptom. Hematuria was present in all but four. The majority of patients applied for relief because of either profuse hemorrhage or some disturbance in micturition. In one of the female patients the chief complaint was inability to void in the standing position. This was later explained by a large cauliflower growth which floated over the internal orifice when in the erect posture, producing an obstruction.

TREATMENT

The treatment used in these cases was fulguration; diathermy, both transurethral and suprapubic; radium; deep x-ray therapy; and resection. In the small tumor cases, where the patients tolerated repeated cystoscopy, the mass was destroyed

transurethrally by means of the fulgurating electrode. The majority of these patients required from five to eight fulgurations, given at one to two weeks' intervals. No tumor was destroyed in less than three treatments. In five patients, following fulguration, radium seeds were implanted through the cystoscope. In eight patients, in whom it was more practical to open the bladder, we utilized surgical diathermy. In twenty-six patients transurethral fulguration alone was used. Deep x-ray therapy alone was used in but two patients; both old men that were practically moribund. However, at times, in other patients, roentgen-ray therapy was added to the treatment. Resection was attempted in five patients, with a mortality of 100 per cent, which is accountable by the fact that these were almost inoperative patients and all had extension of the carcinomatous process into the surrounding tissues. From our meager experience in the treatment of these patients we have come to the conclusion that resection should only be attempted in the advanced patients when one feels certain that there is but little involvement of the perivesical tissues. The small papillomata, regardless of how extensive the infiltration of the bladder wall appears, cystoscopically or roentgenologically, where possible, should be treated by continuous transurethral fulguration. One should not become discouraged if no marked improvement is noted following two or three applications, as sometimes it will require at least twelve different fulgurations to cause a disappearance of the tumor. Where a repetition of these treatments is impossible it is best to open the bladder suprapubically, remove the greater portion of the growth or growths by means of the hot cautery and then use surgical diathermy in the bladder wall, cooking it to the extreme degree. Often it is advantageous to immediately do a suprapubic operation, using surgical diathermy, and not procrastinate with transurethral fulguration. Radium and deep x-ray therapy have been used by us in some of our patients, but we have never been able to see any brilliant results therefrom.

In our series of fifty patients, we have definite proof of ten deaths within one year following treatment; two died in the second year following treatment, and four in the fourth year. Our statistics show that at the end of four years we have five patients alive and well and free from symptomatology. Of these five, four were treated by diathermy alone and one by diathermy with radium.

We also have a record of three patients treated in 1916 by transurethral fulguration; one of whom lived eight years, had a recurrence with metastases and died. The other two are still alive and well, though one had a recurrence three years ago and recurrences again one year ago. The third had no recurrences. Both of these patients were recystoscoped within the last sixty days and show no evidence of recurrence. The clinical aspect of the neoplasms in the three patients was, cystoscopically, identical and were unquestionably malignant.

Surgical Diathermy.—In our more recent patients we have utilized surgical diathermy in preference to other forms of treatment. In a perusal of the literature upon this subject, one finds strong advocates of radium, deep x-ray therapy, cautery knife, and resection in treatment of bladder neoplasms. Kolisher, Corbus, and O'Connor have been the pioneers in advocating the more extensive use of surgical diathermy in the treatment of these growths. At the present day the majority of urologists are treading in their footsteps. The consensus of opinion is that it is the treatment of choice.

Surgical diathermy is the newer method of utilization of electric coagulation of the tissues. It is accomplished by the direct application of the electrode of a high frequency, high amperage, and low voltage current to the tumor mass. By this means, an intense penetrating heat is generated within the tissues, resulting in their complete disintegration.

There are a number of reasons for the universal popularity of this method of therapeutics. Among the more important ones are: the possibility of destroying masses that cannot be removed by any other method; the minimizing of shock, incapacitation, length of time in the hospital; the lessening of the danger of metastases by the sealing of the blood vessels and lymphatics; and the checking of hemorrhage.

REPORT OF CASES

The following two cases are indicative of the work we are doing with surgical diathermy in tumors of the bladder:

CASE 1.—Mrs. A. H., age sixty-five, in whom an electrocardiographic examination shows "myocardial damage," came under observation on April 5, 1928. On cystoscopy, a "berry-like mass" was found posterior to the right ureteral orifice. The growth was twice fulgurated transurethrally. However, it was quite too cumbersome for this method of therapy. We admitted her into the hospital, and under general anesthesia did a suprapubic cystotomy. With one of the disk electrodes, the diathermic current of about 1600 milliamperes was applied for four to five minutes. There was no after-pain whatever, and she made an uneventful and painless convalescence. A piece of tissue sent to the laboratory for examination showed "malignancy of the bladder." Her entire hospitalization was a period of sixteen days. Cystoscopic examination at the present time shows the mass entirely destroyed.

* * *

CASE 2.—Mrs. R. G., age forty-seven, who had had a hysterectomy in 1911, came under observation in October 1924, complaining of hematuria and burning on urination. Cystoscopic examination revealed a tumor of the bladder which was destroyed transurethrally by means of the D'Arsonval fulgurating current. She disappeared until July 1928, at which time she presented herself with a history of hematuria of nine months' duration, and of frequency and pain of three months' duration. On examination a number of cauliflower masses were seen on the trigon and on the posterior aspect of the bladder, extending somewhat on the lateral walls. She was sent to the hospital, and the treatment was similar to that of Case 1. A piece of tissue was sent to the laboratory. The pathological report was: "Papillary epithelioma of the

Fig. 1 (Mr. J. G., age sixty).—Bladder markedly contracted and irregular in outline. Diagnosis: Carcinoma of the bladder. Treatment: Radium and deep x-ray therapy.

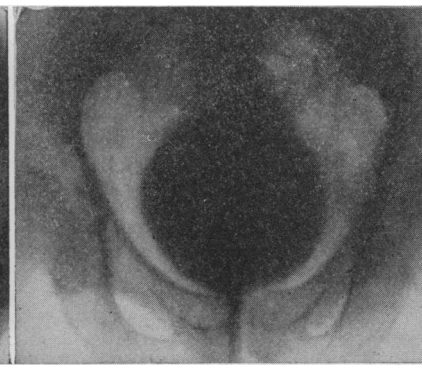

Fig. 2 (Mr. A. F., age fifty).—Slight irregularity about superior margin of bladder. Diagnosis: Papillary carcinoma of the bladder.

Fig. 3 (Mr. J. B., age fifty-six).—Metastases in femur and pelvis.

bladder." She remained in the hospital for a period of twenty-six days. On returning three days later, she had a contracted bladder. This was dilated. One week later cystoscopic examination revealed one small, reddish, tender area near the internal urethral orifice, which was transurethrally fulgurated. Since then her bladder has been cystoscopically negative and she has been free from symptoms.

Photo plates of a few of the more interesting and instructive conditions of this type which were under our observation are submitted.

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DISCUSSION

CHARLES P. MATHÉ, M. D. (450 Sutter Street, San Francisco).—The high mortality of bladder cancer reported by Doctor Jacobs and Doctor Epsteen is similar to that experienced by all urologists treating neoplasms of the bladder. This fact should be a plea for early diagnosis and prompt institution of treatment, and all patients giving the history of hematuria should be cystoscoped. Those presenting microscopic blood should also be examined. I have encountered a number of patients presenting small papillomata in whom the only sign indicating pathologic changes was the finding of microscopic blood cells in the urine in the course of a routine examination. This is particularly important because of the fact that the most common group of bladder tumors, the papillomata, begin as benign growths and later take on malignant properties.

Determination of malignant degeneration in a vesical neoplasm is often difficult because the piece that is removed for diagnosis may not necessarily be from that portion of growth presenting malignancy. Also, the cystoscopic picture is sometimes misleading and cystography is of aid only when the tumor has attained relatively large proportions or has become adherent to the surrounding structures. In making a cystogram, the employment of air as a means of distending the bladder is very dangerous because of the possibility of an air embolus. The pressure employed in order to inflate the bladder can be sufficient to cause the air to enter the venous circulation, particularly when there is ulceration or necrosis of the tumor, and may lead to grave symptoms.

In treating bladder tumors one should not be guided by any given method of procedure. The size and position of the tumor, the ease of surgical approach, etc., are deciding factors. As Doctors Jacobs and Epsteen have emphasized, fulguration is of great value. It is simple, efficacious, and can be repeatedly employed with little shock to the patient. If the growth is not too extensive, clean surgical resection is the best procedure. The tumor is dissected by employing the bistoury, or better, the cautery knife. I have a patient living nine years after surgical resection of a fairly large circumscribed necrotic carcinoma which was situated on the anterior bladder wall. Another patient is living, two years after removal by electrocautery of a necrotic carcinoma from the base of the bladder behind the trigone. Neither has presented any sign of a recurrence.

In operating on malignant tumors of the bladder one must be careful not to spread any of the cancer cells. This is accomplished by continually sponging the incision with sponges soaked with alcohol and by

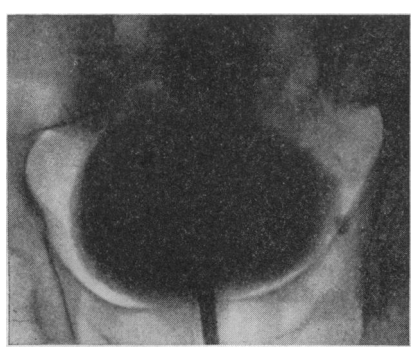

Fig. 4 (Mrs. T. B., age forty-four).—Large smooth tumor in right pelvis, causing bladder pressure.

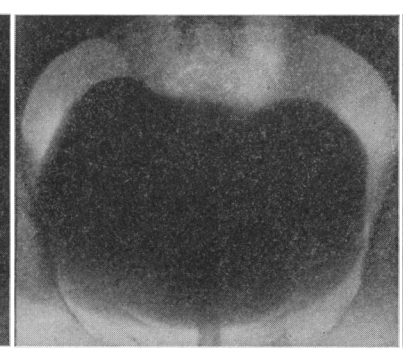

Fig. 5 (Mrs. F. S., age forty-five).—Irregularity of upper portion of the bladder. Diagnosis: Carcinoma of the bladder. Treatment: Transvesical diathermy and radium. No recurrence in three years. Capacity of bladder increased from two to eight ounces.

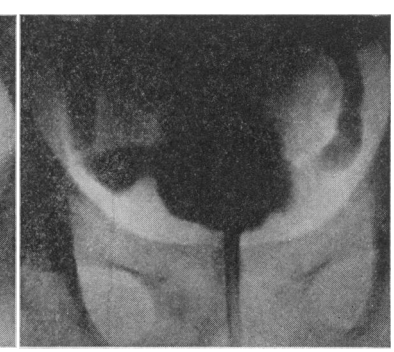

Fig. 6 (Mr. N., age forty-eight). Contracted bladder with irregular outline. Ureteral reflux. Diagnosis: Tumor of bladder.

employing the cautery knife. It is well to examine the bladder periodically every two or three months in order to detect recurrence and to institute immediate treatment.

In patients in whom resection is difficult or impossible the use of diathermy, advocated by the authors, is ideal. In inoperable bladder carcinoma, diversion of the urinary stream by transplantation of the ureters into the skin of the lower abdomen, or into the large intestine, relieves inexpressible misery, alleviates symptoms, lessens invalidism, and prolongs life. It guarantees drainage of urine and enhances the employment of a destructive dose of radium or diathermy through the open bladder, deep x-ray therapy, or cystectomy.

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J. C. Negley, M. D. (Brack Shops Building, Los Angeles).—Several statements by Doctors Jacobs and Epsteen require special emphasis and attention:

First: It is clinically impossible to determine the degree of malignancy, but observers of wide and varied experience usually need only the confirmation of the laboratory to establish their cystoscopic diagnosis.

Second: Cystography has not received the attention it really deserves. Best results are obtained by a flat plate with bladder empty, then a plate with the bladder filled to comfortable capacity with any suitable opaque media. If further information is desired, the bladder may be filled with air and a third plate taken; air cystograms, however, are not without danger.

With all the plates at hand, we sometimes have findings as to size and site of tumor; also evidence of bladder fixation from extension to or from contiguous tissues.

Third: As our skill and improved equipment increases, tumors should be treated more and more by transurethral fulguration. Large size, many repeated fulgurations, degrees of malignancy, and extensive infiltrations do not deter us from using the above method now, as in the past. Personally, my preference is for this method, with deep x-ray before or after, or both.

Surgical diathermy through an open bladder must be resorted to when complications exist, such as extreme hemorrage, with or without bladder full of clots, extreme pain, dysuria, frequency, bladder-neck obstruction, pyelitis, and pyonephrosis. Afterward the bladder should not be allowed to close until all sloughs have come away and until infection has been reduced totally, or to a minimum, and until the patient is in good physical condition. Accomplishment of these results requires three weeks at least, and preferably longer. Extension of malignant tumors from contiguous tissues into the bladder cannot correctly be classed as bladder tumors and, for obvious reasons, only those tumors having their primary origin or location in the bladder wall should be classed as bladder tumors.

A study of the current literature concerning bladder tumors should lead to the following conclusions:

1. No standard treatment has yet been established which is superior to all others.

2. Painstaking diagnosis, using all available methods with information so gained applied to each individual case, rather than following some personal preference, should be used in all cases.

3. Urologists should approach this problem with an open mind, without prejudice or bias, and a full consideration and tolerance toward the experiences of colleagues. Only then can a more nearly idealistic solution of this difficult and interesting situation be achieved.

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Wilbur B. Parker, M.D. (527 West Seventh Street, Los Angeles). — Clinical manifestations of bladder tumors are best brought out through careful histories, repeated urinalyses, and cystoscopic findings. The majority of urologists are handicapped by a previously attempted cystoscopic or biopsy diagnosis which may have resulted in a psychologic depression in an otherwise faithful patient. There are no patients in urology who are more submissive to treatment than the bladder-tumor patients, who can be treated as ambulatory patients.

I have never favored biopsies nor do I believe the supposition that it is within the scope of any man to accurately determine the degree of malignancy of any bladder neoplasm before complete examination of the specimen. It is a pleasure to report in this discussion a similar series as mentioned by the authors treated transurethrally, the patients being treated as ambulatory patients. The method used was persistent repeated thermocoagulations preceded and followed by deep x-ray therapy.

Only two of these patients succumbed within one year from carcinomatosis. The remainder of the patients are alive and well, though 15 per cent have had recurrences during the past five years which have been controlled in the same manner.

Of a similar series by open operations, five only have survived. The latter were of the type that an open operation was the last resort. They were extended every means of treatment recognized of value and as individually indicated.

The object of treatment is the complete and permanent destruction of tumor tissue. That is the ideal for which we strive. I have in my series of cases found that desiccation diathermy or, if you please, thermocoagulation through the cystoscope, combined with x-ray radiation, approaches this ideal nearer than any other method. I have found that an open operation is not necessary now where some years back it would have been my choice. This, of course, brings us back again to the matter of experience. And as it increases, so does my respect for thermocoagulation through the cystoscope plus x-ray. Likewise my pleasure in seeing many of my patients still reporting for observation five years after such procedure. But I bow humbly to the exception to the rule, which is the tumor, the therapeutic indications of which are open bladder surgery. Such usually mean much grief to both the doctor and his patient.

Several of the most extensively involved transurethral patients were members of the medical profession. One in particular presented a bladder with thirteen papillary carcinomata. Others of the laity presented low-grade malignant tumors the size of a man's fist. They are willing to be interviewed as to their present state of well-being after a period of more than four and one-half years.

Cystography, in reference to bladder tumors, seems to be a disappointment, except for confirmation to a certain degree of cystoscopic findings. I am unable, in contact with a number of southern California roentgenologists, to arrive at any other opinion. Surely, the roentgenologists are in a better position to interpret such findings more accurately than the average urologists.

The osseous structures of the pelvis and the unsatisfactory stereoscopic visualization of soft tissues in this area render further explanation unnecessary.

I wish to emphasize and compliment the authors of this paper on their treatment of bladder tumors. Individually extended experience and regular observation cystoscopies of these unfortunate patients will eventually standardize a modality code that will insure in general a more satisfactory percentage of cures.

Truly there is no greater mutable question in the field of urology than the successful control of vesical neoplasms. Location, degree of malignancy, and elapsed time to a great degree control the results in the hands of the most skillful urologist. Any deductions of value that one may make on the observations of the authors will rest alone upon past experience.